Commonwealth of Kentucky
Division for Air Quality

PERMIT APPLICATION SUMMARY FORM

Completed by: Stuart Ecton, B.S. Chemical Engineering

GENERAL INFORMATION:

Name:	Safety-Kleen Systems, Inc. - New Castle Recycle Center
Date application received:	December 15 1998
SIC/Source description:	4953/Refuse systems; recycling, waste materials
AFS Plant ID:	21-103-00005
EIS #:	104-1780-0005
Application log number:	F912
Permit number:	V-99-014

APPLICATION TYPE/PERMIT ACTIVITY:

[x] Initial issuance
[ ] Permit modification
__Administrative
__Minor
__Significant
[ ] Permit renewal

[ ] General permit
[ ] Conditional major
[x] Title V
[ ] Synthetic minor
[x] Operating
[ ] Construction/operating

COMPLIANCE SUMMARY:

[ ] Source is out of compliance
[x] Compliance certification signed
[ ] Compliance schedule included?

APPLICABLE REQUIREMENTS LIST:

[ ] NSR [x] NSPS [x] SIP
[ ] PSD [x] NESHAPS [ ] Other

MISCELLANEOUS:

[ ] Acid rain source
[ ] Source subject to 112(r)
[ ] Source applied for federally enforceable emissions cap
[ ] Source provided terms for alternative operating scenarios
[x] Source subject to a MACT standard
[ ] Source requested case-by-case 112(g) or (j) determination
[ ] Application proposes new control technology
[x] Certified by responsible official
[x] Diagrams or drawings included
[ ] Confidential business information (CBI) submitted in application
[ ] Pollution Prevention Measures
[ ] Area is non-attainment (list pollutants):

EMISSIONS SUMMARY

Pollutant	Actual (tpy)	Potential (tpy)
PM/PM_{10}	1.71* (0.62)	1.71* (0.62)
SO_2	60.63* (0.06)	60.63* (0.06)
N0x	17.08* (13.92)	17.08* (13.92)
CO	4.27* (3.42)	4.27* (3.42)
VOC+	194.59	194.59
LEAD	0.0	0.0
VOC- HAPS **	150.22	150.22
HCl	13.10	13.10

* - Based on #2 Fuel Oil as a worst case. Natural gas combustion is in parentheses.
+ - Partially based on very conservative SOCMI fugitive emission factors.
** - See attachment "A" for a listing of the typical Hazardous Air Pollutants emitted.

SOURCE PROCESS DESCRIPTION:

The New Castle Recycle Center produces and reclaims organic solvents from raw materials and byproducts, used solvents and from mixtures. In addition, the facility blends solvents with little or no recyclable value, along with distillation bottoms and other high BTU materials into a supplemental fuel. The facility uses several primary types of treatment including: distillation, evaporation, mixing, blending and filtering.

Generally, the materials handled at the facility can be separated into four categories: recyclable chlorinated solvents, recyclable flammable solvents, supplemental fuels, and solid fuels. Recyclable solvents are received in bulk and container form and pumped in storage tanks prior to processing.

Solvents received in drums will be normally unloaded at Truck Station No.6 or Truck Station No.2 and ultimately pumped into the respective tank farms prior to solvent recovery or fuel blending. The incoming drums are staged in Container Storage areas 2A and 2B prior to processing.

The New Castle Recycle Center utilizes two separate pieces of equipment for the processing of materials shipped to the facility in containers. Historically, materials shipped in containers have been more difficult to manage than those that arrive at the facility in bulk tanker trucks. The containers often contain a large amount of solidified material, debris and sludges. Approximately half of all the material that is processed arrives at the facility in containers. The facility operates two pieces of equipment to manage these containerized materials. The Automatic Drum Decanting System (ADDS) is utilized to empty the contents of drums that contain liquids and semi-solids. The Shredding System (Shredder) is utilized to manage those materials that contain solid material.

Typically drums containing primarily liquids and semi-solid materials are processed through the ADDS. In the ADDS system, each drum passes across a loading system into an airlock where the atmosphere is nitrogen purged. The drum is then sent to a shear chamber to cut off the bottom of the drum. The contents fall into the fluid recovery system for further handling. The sheared drums are then compressed. The recovered fluid is then pumped to the storage tanks.

SOURCE PROCESS DESCRIPTION continued:

The shredder System manages liquid and semi-solid materials. Drums are loaded onto a conveyor that transports the containers to the drum elevator. The drums are lifted to the infeed hopper, through air lock, and into the nitrogen atmosphere in the processing portion of the system. After entering the process equipment, the drums are processed through a primary and then a secondary shredder. The shredders shred the drums and separate the container from its contents. Once shredded, the materials can be routed to 5 gallon pails, lugger boxes, or the hydrapulper unit for further processing.

Automatic Drum Decanting System (ADDS) Process Description

After completing the laboratory receipt analysis, each container is dispositioned as to how it will be managed, i.e., recoverable solvent, fuel blending, etc. A determination is also made as to which piece of process equipment will be used to process the container. The ADDS is utilized to process those materials that are in a liquid or semi-solid matrix. By changing valve configurations, material may be pumped from the ADDS system to a distillation process feed tank, a fuel blending tank, or any other permitted storage tank.

The ADDS system is a completely enclosed automated drum processing system that is monitored and controlled by a computer system. Since all container processing is conducted within a totally enclosed airtight system, potential exposure of personnel and the environment are minimized. The entire system is operated by two operators, one to monitor the control system and the other to load containers onto the conveyor track.

The ADDS system is operated by loading drums of material onto a conveyor roller track. The drums then enter the process, one at a time, through a nitrogen purged airlock system. As a drum enters the airlock, the exterior door closes and the oxygen level is measured by the computer system. The oxygen level must be below 5% in order for the control system to allow the process to continue. Keeping the oxygen percentage below 5% ensures that while processing flammable materials, a fire cannot occur. If the oxygen level within the ADDS system is not below 5%, a valve is opened and nitrogen flows into the airlock chamber until the oxygen level is satisfactory. Once the oxygen level is below 5%, the interior airlock door opens which allows the drum to enter the process equipment. The interior airlock door closes and the oxygen level is measured in the process chamber. If the oxygen level in this area is not below 5%, it also is purged with nitrogen. When the oxygen level is satisfactory, the control system allows the process to continue. The drum is processed by shearing off the bottom of the container. The contents of the container then flow into a mixing vessel where the contents are blended with other container. From there, the material is pumped to the appropriate tank. After the drum has been emptied by gravity, a hydraulic cylinder then crushes the container to remove any residues that may remain. These materials flow into the same vessel with the liquids. The resulting crushed drum and drum bottom are then shredded by an internal metal shredder. The shredded metal is then washed and passed through a magnetic separator. The magnetic separator removes any nonferrous debris that may be present. The scrap metal is then sold to various steel smelters where it is melted and reused.

Shredding System Process Description

The shredding System typically is utilized to manage those materials that contain solid material. This system may be utilized for materials dispositioned several different ways. Drums containing both liquid and solid material may be shredded, conveyed into a hydrapulper (mixing vessel), blended into fuel, and pumped to a tank for offsite shipment. The Shredding System is also

utilized to shred drums consisting entirely of solid material. The shredded solid material may then be loaded in roll-off boxes for shipment offsite for incineration or energy recovery at a cement kiln. For shredded solid material that contains absorbed liquids, it may be further processed in a squeezer press to remove the liquids. The solid materials from the squeezer press are then shipped offsite for incineration or energy recovery. The liquid material is then shipped offsite for incineration or energy recovery.

The Shredder System is a completely automated and totally enclosed unit purged with nitrogen to ensure that the oxygen level inside the system remains below 5%. The lowered oxygen level ensures that a fire does not occur within the system.

The system is operated similar to the ADDS system in that containers are loaded onto a roller conveyor where they pass through an airlock system into the process equipment. The oxygen level in the airlock and process chamber must be below 5% before the process is allowed to continue. After the control system verifies that the oxygen level is satisfactory, the drum is allowed to be processed through the shredder. The shredded material is then managed as previously described. Prior to exiting the shredding system, ferrous metal is removed utilizing a magnetic separator. The ferrous metal is then washed utilizing the shredding system hydrapulper. The washed metal is then shipped offsite to various steel smelters where it is recycled to reuse.

Squeezer System

The Squeezer System is utilized to process solid materials from the Shredder System that contain absorbed liquids. The Squeezer System processes shredded material into three streams; dry solid material, liquid and scrap metal. The dry solid material is shipped to a cement kiln for energy recovery or to an incinerator. The liquid material is blended into fuel and shipped to a cement kiln for energy recovery or to an incinerator. The liquid material is blended into fuel and shipped to a cement kiln for energy recovery or to an incinerator. The scrap metal is washed utilizing a cleaning solvent and sold to various steel smelters for reuse.

The Squeezer equipment consists of an enclosed nitrogen purged system. The system is operated by feeding material via a screw conveyor into the Squeezer unit. The unit functions by applying hydraulic pressure to squeeze the material in a chamber surrounded by a steel screen. The liquid material passes through the screen while the solid material is discharged into a magnetic separator where ferrous metal is separated. The ferrous metal is collected for cleaning prior to shipment to a smelter for reuse. The remaining solid material is shipped offsite to a cement kiln for energy recovery or to an incinerator.

Tank Storage

There are 64 above ground tanks at the New Castle Recycle Center, 45 of which are permitted for the storage of hazardous waste. There are no underground storage tanks. The total storage capacity is 913,300 gallons. The tank storage capacity permitted to hazardous waste storage is 620,500 gallons. Tanks at the facility are utilized to store a variety of materials which include:

Blend and mix tanks
Boiler fuel storage
Metal wash solvent storage
Wastewater storage
Waste solvent storage
Groundwater collection
Finished product storage

Secondary containment systems are designed, installed, and operated to prevent any migration of wastes or accumulated liquid out of the system to the soil, ground water, or surface water. All secondary containment systems are constructed of reinforced concrete.

All tanks are equipped with an ultrasonic level indicator and alarm system. Prior to transferring any material into a tank, the available volume is determined. The liquid level alarm setting is assigned at 85% of tank capacity. Upon the sounding of a high alarm, the material handler manually shuts down any pump(s) feeding the tank.

Tanker Truck Loading and Unloading

Tanker trucks coming into the facility are emptied via hose connection to the various storage tanks. Tanker trucks that are leaving the facility are bottom loaded at truck station # 4.

EMISSIONS AND OPERATING CAPS DESCRIPTION:

NA

OPERATIONAL FLEXIBILITY:

No applicable regulations limit the amount or type of solvents that can be processed at this facility. This represents significant operational flexibility.

Pollutants of Concern:

Emission Point	Affected Facility	Pollutant	Potential Emissions TPY	
Based on exclusive use of #2 Fuel Oil:				
01 (B-02)	8.4 mmBTU/hr Boiler	CO	1.43	
		$N0_x$	5.70	
		$S0_2$	20.24	
		PM	0.57	
		PM_{10}	0.57	
		VOC	0.08	
Based on exclusive use of Natural Gas:				
01 (B-02)	8.4 mmBTU/hr Boiler	CO	0.77	
		$N0_x$	3.68	
		$S0_2$	0.02	
		PM	0.17	
		PM_{10}	0.17	
		VOC	0.29	
03 (VP1, P2) (controlled by	Evaporation, Vacuum	THC:	1.46	
	System and Distillation	VOC	1.46	thermal
oxidizer	Process: Distillation Column, Reboilers, Heat Exchangers and associated pipeline equipment	HAP*	1.30	required by the MACT @)
05 (NF1-NF10)	Ten 18,500 gallon Fixed Roof Waste Organic Solvent Storage Tanks	THC:	16.47	
		VOC	16.47	
		HAP*	14.64	
06 (S1-S14)	Fourteen Fixed Roof Waste Organic Solvent Storage Tanks: One 20,000 gallon One 16,000 gallon Eight 15,000 gallon Four 8,000 gallon	THC:	14.7	
		VOC	14.7	
		HAP*	13.1	
07 (D1-D7)	Seven 7,500 gallon Fixed Roof Waste Organic Solvent Storage Tanks	THC:	2.98	
		VOC	2.98	
		HAP*	2.65	

Emission Point	Affected Facility	Pollutant	Potential Emissions TPY
08 (R1-R11)	Eleven Fixed Roof Storage Tanks: Waste Organic Solvent Tanks (R1 through R5): Three 10,000 gallon Two 6,000 gallon Organic Solvent Tanks (R6 through R11): Six 6,500 gallon	THC:	6.05
		VOC	6.05
		HAP*	5.38
09 (A1-A12)	Twelve 19,000 gallon Fixed Roof Organic Solvents Storage Tanks	THC:	3.71
		VOC	3.71
		HAP*	3.30
11 (V1-V5)	Two 20,000 gallon Fixed Roof Waste Organic Solvent Storage Tanks Three 15,000 gallon Fixed Roof Waste Organic Solvent Storage Tanks	THC:	9.51
		VOC	9.51
		HAP*	8.45
Based on exclusive use of #2 Fuel Oil:			
18 (B-02)	16.7 mmBTU/hr Boiler	CO	2.84
		$N0_x$	11.38
		$S0_2$	40.39
		PM	1.14
		PM_{10}	1.14
		VOC	0.16
Based on exclusive use of Natural Gas:			
18 (B-02)	8.4 mmBTU/hr Boiler	CO	2.56
		$N0_x$	10.24
		$S0_2$	0.04
		PM	0.45
		PM_{10}	0.45
		VOC	0.42
20 (HPV1, HPV2)	Two 15,000 gallon Homogenizing Process Vessels	THC:	5.61
		VOC	5.61
		HAP*	5.61

Emission Point	Affected Facility	Pollutant	Potential Emissions TPY
21 (MP02)	Automatic Drum Decant System (ADDS)/Shredder	THC: VOC HAP*	4.49 (controlled by 4.49 thermal oxidizer 3.99 required by the MACT @)
22 (-)	Pipeline equipment: Pumps - 38 Flanges - 754 Valves - 766 Open Ended Lines - 446	THC: VOC HAP*	80.82 (controlled by a 80.82 required Leak 71.85 And Repair Program)
23 (MP01, MP03)	Drum Shredder, N_2 purge, Shaker Screen, Hydrapulper	THC: VOC HAP*	9.75 (controlled by 9.75 thermal oxidizer 8.67 required by the MACT @)
24 (-)	Solids Separator (Screw Press, Squeezer System)	THC: VOC HAP*	5.35 (controlled by 5.35 thermal oxidizer 4.75 required by the MACT @)
25 (-)	Containers- Larger than $0.46m^3$ (121.5 gallons) Ten (10) Roll Off Boxes Fourteen (14) 40 yd^3 (8,079 gallon) Dump Trailers Forty-eight (48) 1.5 yd^3 (303 gallon) Portable Hoppers	THC: VOC HAP*	7.35 7.35 6.53
27 (-)	Bottom loading of recovered solvent into tanker trucks	THC: VOC HAP*	26.1 26.1 23.2

* See Attached list of HAPS present. Approximately and on average the VOC will be 89% HAP.
@ 13.1 TPY of **Hydrochloric Acid** is emitted from the Thermal Oxidizer as a result of the combustion of chlorinated hydrocarbons.

ATTACHMENT TO POC TABLE

Toluene
Methanol
Acetone
Isopropanol
Methyl Chloride
Methyl Ethyl Ketone
Ethyl Acrylate
Xylenes
1,1,1-trichloroethane
Isopropyl Acetate
N-Butyl Acetate
Perchloroethylene
Propylene Glycol Methyl Ether Acetate
Ethyl Benzene
Ethylene Glycol Ethyl Ether Acetate
Ethylene Glycol Hexyl Ether
Acetaldehyde
Acetamide
Acetophenone
Benzene
Carbon Tetrachloride
Chlorobenzene
Chloroform
Cresols
Cumene
Dibutylphthlate
1,4-Dichlorobenzene
Dimethylformamide
1,4-Dioxane
1,2-Epoxybutane
Ethylene Dichloride
Ethylene Glycol
Formaldehyde
Hexane
Hydrochloric Acid
Hydroquinone
Methyl Methacrylate
Phenol
Propionaldehyde
Styrene
Titanium Tetrachloride
o-Toluidine
1,2,4-Trichlorobenzene
1,1,2-Trichloroethane
Trichloroethylene
Vinyl Acetate
Vinyl chloride
Isophorone
Naphthalene
2-Nitropropane

Non HAPs are italicized